EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	("20030210532").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/10/28 18:56
L3	1955	(cable$1 near8 pcb)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/10/28 18:56
L4	11	(cable near8 pcb) near8 equivalent	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/10/28 19:45
L5	4	computer near5 pci near slot near8 common$2	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/10/28 19:45
L6	8	computer near5 pci near slot$1 near8 common$2	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/10/28 19:45
S2	569	("361"/$).ccls. and ((USB or "universal serial bus") near8 port$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 11:27
S3	113	("361"/$).ccls. and ((USB or "universal serial bus") near8 port$1) and hub	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 15:58
S5	123	internal near8 ((usb or "universal serial bus") adj port$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 14:44
S6	4	("6678747"|"6772253"|"6904373"|"6363491").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 14:43

S7	1	("6928562").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 14:43
S9	49	internal$2 near4 ((usb or "universal serial bus") adj hub)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/10/27 20:56
S10	9	internally near4 ((usb or "universal serial bus") adj port$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 17:27
S11	14	inside near4 ((usb or "universal serial bus") adj hub)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 15:22
S12	8	motherboard$1 near4 ((usb or "universal serial bus") adj hub)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 15:39
S13	1	("5903777").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 15:43
S14	1	("5933611").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 15:44
S15	1	("6603744").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 15:44
S16	12	internal adj ((USB or "universal serial bus") adj2 port$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 16:02
S17	3	("20040033734"|"5444298"|"200302 10532").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 16:27

S18	20	(usb or "universal serial bus") adj header$1	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 16:27
S19	284	external near4 ((usb or "universal serial bus") adj port$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 18:19
S20	70	external near4 ((usb or "universal serial bus") adj hub$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/05 15:19
S22	83	((usb or "universal serial bus") adj hub$1) same root	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 18:29
S23	1219	((usb or "universal serial bus") adj hub$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/01 18:29
S24	9	(("universal serial bus" or usb) adj port) near8 computer near8 motherboard	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/05 15:30
S25	52	(("universal serial bus" or usb) adj port) near8 motherboard	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/05 17:13
S27	188	("universal serial bus" or usb) near5 extension	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/05 17:29
S29	22	("universal serial bus" or usb) near5(extension adj cable)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/05 19:07
S30	1	("6819677").PN.	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/06/05 19:07

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S31	145	internal near8 ((usb or "universal serial bus") adj port$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/10/23 22:15
S32	65	internal near8 ((usb or "universal serial bus") adj hub$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/10/23 22:15
S33	10	("5167024" | "5675813" | "5799196" | "6216188" | "6279060" | "6415342" | "6493770" | "6671814").PN. OR ("6928562"). URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2006/10/23 22:25
S34	15	("20030041205" | "20030178486" | "6017231" | "6206480" | "6253329" | "6379167" | "6619971" | "6662259" | "6688521" | "6705878" | "6776345" | "6814597" | "6867979" | "6928562" | "6934788").PN. OR ("7124215"). URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2006/10/23 22:25
S35	15	("20030041205" | "20030178486" | "6017231" | "6206480" | "6253329" | "6379167" | "6619971" | "6662259" | "6688521" | "6705878" | "6776345" | "6814597" | "6867979" | "6928562" | "6934788").PN. OR ("7124215"). URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2006/10/23 22:33
S36	145	internal near8 ((usb or "universal serial bus") adj port$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/10/23 22:44
S37	62	internal near8 ((usb or "universal serial bus") adj connector$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/10/23 22:44
S38	6	(usb or "universal serial bus") near2 daughter$5	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/10/23 22:54
S39	27	("5675813" | "5884086").PN. OR ("6000042").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2006/10/23 23:45

S40	18	((usb or "universal serial bus") adj hub) same ("3.3v" or "3.3")	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/10/27 21:10
S41	150	multiple near4 (host near controller$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; IBM_TDB	OR	OFF	2006/10/28 18:33

The cable also carries VBUS and GND wires on each segment to deliver power to devices. VBUS is nominally +5 V at the source. The USB allows cable segments of variable lengths, up to several meters, by choosing the appropriate conductor gauge to match the specified IR drop and other attributes such as device power budget and cable flexibility. In order to provide guaranteed input voltage levels and proper termination impedance, biased terminations are used at each end of the cable. The terminations also permit the detection of attach and detach at each port and differentiate between high/full-speed and low-speed devices.

4.2.2 Mechanical

The mechanical specifications for cables and connectors are provided in Chapter 6. All devices have an upstream connection. Upstream and downstream connectors are not mechanically interchangeable, thus eliminating illegal loopback connections at hubs. The cable has four conductors: a twisted signal pair of standard gauge and a power pair in a range of permitted gauges. The connector is four-position, with shielded housing, specified robustness, and ease of attach-detach characteristics.

4.3 Power

The specification covers two aspects of power:

- Power distribution over the USB deals with the issues of how USB devices consume power provided by the host over the USB.

- Power management deals with how the USB System Software and devices fit into the host-based power management system.

4.3.1 Power Distribution

Each USB segment provides a limited amount of power over the cable. The host supplies power for use by USB devices that are directly connected. In addition, any USB device may have its own power supply. USB devices that rely totally on power from the cable are called bus-powered devices. In contrast, those that have an alternate source of power are called self-powered devices. A hub also supplies power for its connected USB devices. The architecture permits bus-powered hubs within certain constraints of topology that are discussed later in Chapter 11.

4.3.2 Power Management

A USB host may have a power management system that is independent of the USB. The USB System Software interacts with the host's power management system to handle system power events such as suspend or resume. Additionally, USB devices typically implement additional power management features that allow them to be power managed by system software.

The power distribution and power management features of the USB allow it to be designed into power-sensitive systems such as battery-based notebook computers.

4.4 Bus Protocol

The USB is a polled bus. The Host Controller initiates all data transfers.

Most bus transactions involve the transmission of up to three packets. Each transaction begins when the Host Controller, on a scheduled basis, sends a USB packet describing the type and direction of transaction, the USB device address, and endpoint number. This packet is referred to as the "token packet." The USB device that is addressed selects itself by decoding the appropriate address fields. In a given transaction, data is transferred either from the host to a device or from a device to the host. The direction of data transfer is specified in the token packet. The source of the transaction then sends a data packet or indicates it has no